

PATENT COOPERATION TREATY

26 JAN 2005

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 40156	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI 2003/000630	International filing date (day/month/year) 28.08.2003	Priority date (day/month/year) 28.08.2002
International Patent Classification (IPC) or national classification and IPC B01D 1/06		
Applicant STERIS EUROPE INC. SUOMEN SIVULIIKE et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input checked="" type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 17.03.2004	Date of completion of this report 24.11.2004
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☐ the description:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ the drawings:

pages _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-10</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

The invention

The present invention concerns production of purified steam using a falling-film evaporator and rising channels for separating water droplets and impurities.

Highly purified steam is required for various medical purposes, such as production of pharmaceuticals, demanding sterilization applications and production of water for injection.

This requirement is met by producing steam and liquid in the falling-film evaporator. The liquid is collected below the lower end of the evaporator. A flow of steam is conducted upward in a spiralling rotational path. Droplets are separated from the upward flow. The separated droplets form a reject stream, which is removed from the process. A part of the collected liquid is returned to the feed stream to form a circulating liquid.

Cited document

This document is cited in the International Search Report. The citation is considered to describe the most relevant prior art:

D1) US-A1-3 875 017

A multi-stage thin film evaporator having a helical vapour flow path is already known from D1. Water which was not

.../...

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of Box V

evaporated in a distillation stage (10) continues by a pipe (23) to an evaporator of a distillation stage (11) (fig. 1 & column 2, lines 31-37). The vapour liberated in the distillation stage rises upwardly in an annular space between a tube (77) and a jacket tube (79) and is forced to travel upwardly through a helical flow duct (80). In this duct the vapour has a high velocity, as a result of which the radial acceleration flings any water droplets which may have been entrained with the vapour through small apertures (81) into an annular space (82), whence they run back down. The pure vapour continues its upward flow and departs through the pipe (83) to the next distillation stage (fig. 4 & column 4, lines 53-65).

The invention is particularly appropriate for the distilling of sea water to become household or other service water or for producing distilled water e.g. for pharmaceutical purposes (column 1, lines 7-11).

Analysis

D1 is cited in the International Search Report as a document of particular relevance and is now considered to show the closest background art. The reason for this review is that claim 1 specifies that the separated droplets form a reject stream which is continuously removed from the process.

These features are not revealed in D1. According to D1, the droplets from the separator in each stage enter the next stage to be partially evaporated. Consequently the evaporator in D1 does not anticipate the technique of claim 1.

The method for producing a solution according to claim 1 is considered to give rise to an unexpected technical effect, i.e. the impurity fraction is separated from the system immediately. Thus, this claim is not considered to describe a technique that is obvious to a person skilled in the art.

Independent claim 6 describes a device for carrying out the method according to claim 1. The claim describes an exit tube. This tube makes the separation of the droplets possible, which is revealed in claim 1. So claim 6 is also considered to have an inventive step.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Conclusion

In accordance with the arguments stated above, the invention in claims 1-10 is novel, considered to involve an inventive step and has industrial applicability.

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims shall contain: a characterising portion - preceded by the words "characterised in that," "characterised by," or any other words to the same effect (Rule 6.3 (b)).

Where the international application contains drawings, the technical features mentioned in the claims shall preferably be followed by the reference signs relating to such features. See Rule 6. 2 (b).